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# Biographical History of Massachusetts

## Biographies and Autobiographies of the Leading Men in the State

SAMUEL ATKINS ELIOT, A.M., D.D.
Editor-in-Chief

Volume I

With opening chapters on

What Massachusetts Stands for in the History of the Nation

By EDWARD EVERETT HALE, S.T.D., LL.D.

MASSACHUSETTS BIOGRAPHICAL SOCIETY
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# BIOGRAPHICAL HISTORY OF MASSACHUSETTS

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"There is properly no history, only biography." — *Emerson.*

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"Present to the boy such men as he himself would like to be." — *Herbart.*

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"Universal history, the history of what man has accomplished in this world, is at the bottom the history of the great men who have worked here."

— *Carlyle.*

"A sage is the instructor of a hundred ages."

— *Mencius, Chinese Philosopher.*

"The function of the great man is to explain the age, and of the age to explain the man." — *Barnes.*

"The history of the race is but that of the individual 'writ large.'"

— *Lewes.*

"Lives of great men all remind us
We can make our lives sublime."

*Longfellow.*

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# EDITOR'S PREFACE

IT is a perfectly legitimate curiosity with which people ask about the facts and motives and incentives of a notable life. In every man of distinction men see what is possible for all humanity. A life first lived, then written, and then read, is the best source of inspiration for other lives.

We do not know the real history of any age or country until we have clearly seen its characteristic men. To know the heart of any event we must see it revealed in the achievements, passions, and hopes of individuals.

The men whose struggles and successes are described in this book are not all men of great historic significance, or of special and peculiar gifts. They are men who have displayed the virtues that have made Massachusetts the sturdy and self-reliant Commonwealth that it is; men who possess the healthy and universal qualities of human nature that are close to the heart of all sorts and conditions of men. These lives are near enough to the average life of humanity to have lifting power.

The reader of these brief biographies will find his own resolutions and ideals reinvigorated; his own intentions realized, and his own manhood, not swamped, but vitalized and given new direction. He will broaden his horizon and learn how to enter into sympathy with occupations and pursuits that before seemed uninteresting. One realm of human endeavor after another will become vivid as it is seen through the enthusiasm of men who have there worked and suffered and won.

The selection of the names included in this and the succeeding volumes has been made by the Advisory Committee. Most of the men described are now active in business and professional careers, but a few sketches have been added of men whose achievements are still fresh in memory. The biographies have been prepared by experienced writers, and are in no small degree autobiographical,

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for each man, in answer to questions, has described in his own way his inheritances and environment, and the facts of his career.

The portraits in this book increase its value. Said Thomas Carlyle: "Often I have found a portrait superior in real instruction to half a dozen written biographies, . . . or rather, let me say, I have found that the portrait was as a small lighted candle by which the biographies could for the first time be read, and some human interpretation be made of them."

The volume is submitted to the public in the confidence that the careers herein described will be found stimulating to patriotism and potent to cheer and inspire other lives.

Samuel A. Eliot.

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# INTRODUCTION

## WHAT MASSACHUSETTS STANDS FOR IN THE HISTORY OF THE NATION

THE popular institutions which grew up almost of themselves in Massachusetts, succeeded so well that they became, one may say, the object lessons for the different American States, as they came into being. For this continent, Massachusetts became somewhat what Switzerland became in Europe, — an example of Government of the people, for the people, by the people.

After the death of Winthrop till the outbreak of the Revolutionary War, no special Leader of the people can be named who directed or gave form to the political or religious institutions of the colony and province. But when an exigency came that exigency was met as well as they knew how to meet it. If a plan for finance or commerce, or manufacture worked well, why it worked well and it became permanent. If it did not work well, why, it did not work well, and it was forgotten. What followed was that the quaint charter of a trading company developed into the government of a State which was independent. The appointment by the Crown of a Governor-general of New England became merely the occasion of petty local controversy, but the State governed itself. Mr. Choate was quite within the strictest bounds of history when he said that she showed to the world a church without a bishop and a State without a king.

What she had of the rights and privileges of an independent nation appeared when she declared war against George Third, who thought himself the strongest monarch of his time. In the war which followed this State swept the sea with her ships and crippled the commerce of England. For long periods in the war, Massachusetts had more seamen engaged against King George's navy than were serving in that navy against her.

As history is made up by the lives of the men who direct history, the volumes in the reader's hands are offered as a valuable contri-

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bution to the history of the three centuries which have passed since Captain John Smith pronounced the home of the Massachusetts Indians to be the Paradise of New England. The name Massachusetts seems to appear first in literature when the Massachusetts Indians are thus spoken of by him in 1615.

He names the Massachusetts Indians among forty or fifty other communities which he had seen or heard of in his voyage along the shores of what he called Massachusetts Bay. He sometimes spells the word with *u* in the third syllable and sometimes with the letters *ew*. The name was then applied to a group of Indians who lived around what we call the Blue Hills, — *Matta* and *chusett*, meaning the Great Hills. Smith says that "their home is the paradise of those parts." The name of the bay has extended since in familiar use so that it now comprehends the great bay between Cape Ann on the north and Cape Cod on the south-east. Gosnold had coasted the shore of that bay as early as 1602. But he does not use the name Massachusetts. The natives of those shores were acquainted in a way with Europeans from the visits of French and English fishermen.

In 1621, when the Pilgrim Fathers were established by a residence of a few months in Plymouth, they sent a party to explore the shore north-west and north of them and they speak of this voyage as their voyage to the Massachusetts. The phrase meant to them what it meant to Smith, the region immediately west of the present city of Boston. And nine years later, when in 1630, John Winthrop came up the bay to judge of its resources for his colony, he speaks of going "from Salem to Massachusetts."

The company under whose charter he had led out his party of emigrants had been called the Massachusetts Company in that charter two years before. The Massachusetts charter was granted by Charles the First to a company of Puritan adventurers who furnished the capital for the undertaking. Some of them were from London, and the east of England, and some more were friends of John White, of Dorchester, in the south-west of England. They had purchased from an older company, named the New England Company, such rights as they had in the premises. The charter of 1628, which laid the foundation of the present State of Massachusetts, gave what we should call sovereign rights to a territory running from the Atlantic to the Pacific. Its boundary on the north

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was to be a line three miles north of the Merrimac River, and on the south, a line three miles south of Charles River. From the geographical points which showed the northern limit, and the southern limit of this grant, the boundaries were to run west till it struck the South Sea, the name then given to the Pacific Ocean. Southward, from the very beginning, it was understood that the northern boundary of the old colony of Plymouth was the southern boundary of Massachusetts.

In fact, no very accurate account was kept in London of these grants. And when it subsequently proved desirable to assign to the Duke of York that territory which is still called New York, its eastern limit ran north to Canada, and thus were extinguished practically, our claims by royal patent to the States of Michigan and Wisconsin and other sovereignties west of them as far as Oregon. The kindred title of Connecticut to territory west of her survived far enough to give to that State the property which is still called "the western reserve" in the State of Ohio.

The colony of Massachusetts Bay thus chartered was united with the colony of Plymouth under the second charter in the year 1691. As the province of "Massachusetts Bay" with which was connected the Province of Maine, Massachusetts declared war against the King in the next century. When in 1780 she established her own constitutional government, the word bay was dropped from the title and it is as the Commonwealth of Massachusetts that she is one of the United States formed by the Federal Constitution in 1787.

The space occupied by the State upon the map is not considerable. As Mr. Everett said on a celebrated occasion of the dominions of the House of Hapsburg, it is but a speck on the map of the world. But from the very first she has made herself known in the rest of the world, and her sons feel that the rest of the world has profited by what she has taught them. In the volumes in the reader's hands some attempt is made to show her influence in the development of the civilization of the world as some of her distinguished sons have lived for mankind.

It should be remembered by all who read American history or American biography that the colonists who came into Massachusetts Bay with Winthrop and those who followed them in the next ten years were led by idealists who had very distinct views as to the

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government, whether of the church or of the State. These views were the advanced views of their time, and that reader is very much in the dark who supposes that the radicalism of these men is to be traced simply in their theological or ecclesiastical opinions. No! They were Independents of the Independents; they were such men as Cromwell delighted in. Those of them who chose to go back to England to join in the great contest of the century generally allied themselves at once to Cromwell's party, the party of the Independents. In many instances they led that party. As their ecclesiastical leaders in the Westminster Assembly proved to be leaders in the proposals for the church, so such men as Hopkins and Sedgwick proved to be leaders in the direction of the war and of Cromwell's administration. Edward Hopkins, the same whose prizes are now distributed at Harvard College every year, the godfather of Hopkinton in Massachusetts, was the head of Cromwell's Board of Admiralty, which continues as the Board of Admiralty of England to this day. It was under his direction, for instance, that the English took Jamaica which they hold to-day.

The accurate reader should recollect that the term New England for the States which grew up east of New York is first used by John Smith after his voyage of 1614. It is now of no great importance but it is worth remark that the name Mattachusetts with *tt* instead of *ss* in the first syllable is retained in official documents almost always for the first century. In the Algonquin dialects these letters are sometimes interchanged, as where Miss-issippi means the great river to this day. The root is the same as that used in Massachusetts, — the great mountain.

About ten thousand persons crossed the ocean westward under the impulse given by the Massachusetts Company within the first ten years after John Winthrop's voyage. But when in 1642, Harvard College sent out eight young men with the degree of Bachelor of Arts, four of them "returned home," as they would have said, meaning to England. They went back to play their part in the country in which they were born, so soon to lose its name as a kingdom. And in the twenty years which followed, one of the writers of the time says that more persons had emigrated from New England to old England than had come westward expecting to find homes here.

So close was Cromwell's interest in the New England of that day

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that after his conquest of Jamaica, he wrote an official letter to the magistrates of Massachusetts to propose to them that the New England Colony should remove to Jamaica. In a conversation with Governor Leverett, of which we have Leverett's account in detail, "His Highness, the Protector" urged his plan upon the New Englanders. Leverett replied sturdily that in no plantation of England were settlers so well established as in New England. And the General Court, at Leverett's suggestion, wrote a respectful letter to the Protector on the 12th of October, 1656, declining his proposal. From the whole of the interesting correspondence it is evident that the State of Massachusetts was well established, that its rulers were confident that they could hold their position, and that while they wished to deal with the Protector with all courtesy, they felt that they were in no way dependent upon the home government. Their complete satisfaction with this position appeared definitely when Philip's War broke out in 1674. They never asked the government of England for a soldier or an ounce of powder or of lead, nor for the slightest assistance of any sort by which they should maintain their position here.

The reader must remember from the date of the very first settlement that every Englishman in Plymouth or in Massachusetts was here because he did not want to be in England. They did not like the way in which things were done in England. They came here because they did not like it. And they found very soon that they had white paper to write upon. If the English forms were disagreeable, why, they could drop the English form and who should say nay? An amusing instance is that of the halberds which poor Governor Winthrop tried to use in his escort on state occasions. The halberds were "unpopular," as we should say to-day. Winthrop had to order his own servants to carry them, and from that moment there were no halberdiers.

It is true that they could hardly appeal to the authority of England if they would. Often, the early settlers were six months without news from England. But we must observe also that they did not want to appeal there. Years after Winthrop's settlement, when they were asked to show the royal colors on the arrival of one of the King's ships, they had no royal colors to show. They did not want to have any.

This is to say, in other words, that they could carry out their

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own plans for self-government. And they did. When the hundred persons who established Plymouth arrived in Provincetown, in August, 1620, they met together and the men signed the compact which has become famous, by which they agreed to obey their own governor and to make their own laws. Very soon they had to make deeds and wills which transferred real property from one owner to another. Now, this matter of probate of wills was one of those which in England was left to the ecclesiastical courts, — and is left so to this day. But these people had come here because they detested the English church and its establishments. The people, therefore, established their own courts of registry and for the probate of wills. The system which they established has gone over all America and no ecclesiastic, as such, has anything to do with it.

Cases not unlike this turned up constantly in the early legislation of the General Court of Massachusetts. That court attended to such affairs and very soon had to make their own code. As early as May, 1635, it was agreed that a committee should "frame a body of grounds of laws in resemblance to a Magna Charta which being allowed by some of the ministers and the General Court should be received for fundamental laws." In 1641, what is now known as the "Body of Liberties" of Massachusetts had got itself prepared. Nineteen copies of it were made and they were sold to the separate towns for ten shillings a piece for each copy. The session of the General Court for December continued three weeks and established the code by authority. But this code did not satisfy the people and from year to year the "Body of Laws" was enlarged and improved upon until they were printed in 1660.

Now of this Body of Laws, as Hon. Francis Calley Gray says "in the main, it is far in advance of the times and in several respects in advance of the common law of England to this day." The author, John Ward of Ipswich had studied the English law carefully. He knew what he was about, and if he went beyond its requisitions, so much the worse for the common law of England. The common law of New England meant to go farther.

From the restoration of the royal family in England, down to the outbreak of the American Revolution, there intervenes a century of history in which so far as political allegiance went the men of Massachusetts were not apt to repair to England to establish their homes. For, simply, while the principles of feudalism had, on

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the whole, prevailed in England, the principles of the Commonwealth had prevailed in New England. The Anglican Church was the Established Church of old England, the Congregational Church was the Established Church of New England. Such reasons there were for chilling the ardor with which the New Englanders of the first generation "went home" as a resident on the Pacific coast to-day may go back to the Atlantic coast to die.

But the commercial relations of New England with Old England were still very close. The first governor of Massachusetts had had the wisdom to see what were the remarkable facilities of the bay for the building of ships. He tempted some of the first shipbuilders of the time to come to America, and from this time, for a hundred and fifty years, the export of ships was a great feature in our industries. When Lord Bellomont became the Governor-general of New England, at the end of that century, he wrote home in an official letter that the maritime commerce of the port of Boston was larger than that of all Scotland, that more ships were built and owned here than sailed from all the ports of Scotland.

The colonies, however, were still receiving most of their manufactured articles from England. Inventories and advertisements show that after the year 1700 the Massachusetts people were reading English books and were sometimes reprinting them. Bunyan tells us that the first edition of the "Pilgrim's Progress" was reprinted in America. Alas, not a single copy of the edition seems to have escaped the destructive hands of so many readers. Cotton Mather printed the "Magnalia" in London. The first edition bears the date of 1702. Its circulation, however, was of course, principally in New England and no American edition was printed until 1820. Among theologians, Jonathan Edwards's work on "The Will" had attracted attention in England and was reprinted there.

It was, then, with a certain surprise that the thoughtful men in England read the first *American State Papers* which appeared in 1760 and later down regarding the subjects at issue between the Province of Massachusetts and the King of England. Papers written by such men as the two Adamses, James Otis, and Franklin might challenge comparison easily with any writings of any Englishmen of their time. And these papers came from a colony which had been most known in General Wolfe's despatches and which sent to England ships and furs and potash and fish. As Sir George Tre-

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velyan has recently shown us, the friends of America in England at that time were more in number than the advocates of the Crown's proposals. Among them there was a little handful of officers who had served in the colonies who were not surprised by the dignity and effectiveness of the State Papers which came from America in the next thirty years.

This ignorance was due not simply to the condescension which Mr. Lowell observes with which to his time all Europe regarded all America. It was the personal ignorance in each continent of the inhabitants of the other. Illustrations of this ignorance may be found even in Lord Chatham's well-known speech in which he reviews the *American State Papers* and in Edmund Burke's acknowledged surprise when he studied the resources of New England. It is pathetic, indeed, to read in the diaries of the loyalists who took up their homes in London while the Revolution went on, that the men of England regarded them with a sort of pity, only too plainly expressed, and wondered what was their business in England.

Such considerations, although briefly stated, are enough to account for the pride with which Massachusetts men look back on their own history. They have been encouraged in their pride in the history of the Commonwealth by thoughtful men in all parts of the world. Carlyle said truly that "Democracy announced on Bunker Hill that she is born and will envelope the whole world." And in one way and another, that statement is assented to by the modern students of history. I was in London in 1859, when we heard the news of John Brown's attack on Harper's Ferry. At that time the *London Times* was the most constant enemy of liberal institutions; and yet that journal, in a leading editorial said, "the sympathy of the people of Massachusetts has a title to the consideration of the world. No community of which we have any knowledge approaches in enlightenment or morality to the inhabitants of this part of the Union."

"Had it not been for the Puritans, political liberty would probably have disappeared from the world."

This is the brief summary by Mr. John Fiske of the demonstration with which he shows that the settlement of Plymouth and Massachusetts was not simply one little chapter in the series of interesting adventures, but that it laid the foundation of what we call constitutional liberty in all the world. In the carefully considered

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chapters in which this distinguished philosopher introduces his book on the beginnings of New England, he justifies completely the epigram of Rev. Mr. Zincke to which Charles F. Adams and Edwin D. Mead have called such wide attention. Every event in history is to be judged of more or less importance according as it is more or less closely connected with the voyage of the *Mayflower*.

The leading men in Massachusetts and the men who have written their biographies in these volumes are well aware that for victory Massachusetts is different in foundation and in principle from the history of any other part of the world. They are apt to acknowledge, with a proper pride, this distinction of their position. They are often charged with arrogance because they are willing to acknowledge it. But we cannot help that. History is history. And we of Massachusetts gladly accept its verdict with the belief that Government of the people, for the people, by the people, as it is attempted now in the world finds some of its earliest and most important lessons in our history.

Edward E. Hale

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# WILLIAM WATSON

WILLIAM WATSON, engineer, educator, pioneer in technical instruction, author of technical and scientific books and papers, secretary of the American Academy of Arts and Sciences from 1884, was born in Nantucket, Massachusetts, January 19, 1834. His father, William Watson, son of Joel and Elizabeth (Skinner) Watson, married Mary Macy, daughter of Peleg and Sarah (Wendell) Macy, granddaughter of Jonathan and Lois (Gorham) Macy and a descendant of Thomas Macy who came from near Salisbury in the parish of Chilmark, England, where he married Sarah Hopcott, prior to his embarkation to the Massachusetts Bay Colony in 1635. We first hear of Macy at Newbury and then at Salisbury, where he held positions of honor and trust: he was a planter, a merchant, and withal a preacher, and frequently exhorted the people on the Sabbath.

Thomas Macy.

In 1656–57 severe laws were passed against the Quakers and Baptists, the latter affecting Macy who was thereby forbidden to exhort in the absence of a minister.

Macy, a man of great energy, resolved not to submit to the bigoted laws of the rulers, who were entirely governed by the clergy, if it were possible to find a place where religion was not a sin, unless observed according to the views and doctrines of the majority of the Pilgrims.

Imbued with this idea, early in 1659, he, with nine associates, purchased the island of Nantucket which was then under the jurisdiction of New York.

In August, 1659, during a severe storm, four Quakers took shelter in his house, and remained three quarters of an hour.[1]

For this offense Macy was fined thirty shillings, and ordered to be admonished by the governor. He paid his fine, and accepted his

[1] Two of these, William Robinson a London merchant, and Marmaduke Stephenson of Yorkshire, were hanged on Boston Common Oct. 27, 1659, for supporting the Christian principle as professed by the Friends or Quakers.

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admonition, but resolved that it should be his last. So, on the following October, he embarked in a small sailboat with his wife and children and such household furniture as he could conveniently carry, in company with Isaac Coleman and Edward Starbuck, and sailed for Nantucket, where they arrived without accident. [See Whittier's poem "The Exiles."]

William Watson, Jr., was from his childhood especially fond of mathematics. He was the fortunate son of a remarkably intellectual and forceful mother who encouraged his youthful studies, and at the same time by her example and precepts directed his mind toward moral and spiritual truths that helped to form his character. His early reading included Bowditch's "Practical Navigator," books on astronomy, on the use of the globes, and on mathematics. His school instruction was gained at the Coffin School, founded by Admiral Sir Isaac Coffin, and at the public high school at Nantucket, where he was graduated with honors. His personal preference directed him to teaching as a profession, and to perfect himself in pedagogy he took, in 1850, a course at the Bridgewater State Normal School, and on graduating, taught two years. He entered the Lawrence Scientific School of Harvard University in 1855, and gave the instruction in descriptive geometry for a year.

**Boyden Prize in Mathematics.**

In 1857 he entered as a competitor for one of the Boyden prizes. These extraordinary prizes were awarded upon a competitive examination conducted in writing, consisting of the solution of questions proposed by the committee, which covered the ground of analytic mechanics as far as this science is presented in the most complete authorities, and occupied the whole of two successive days. The examining committee, consisting of Professor Peirce, Lovering and Eustis, unanimously awarded the first prize of three hundred dollars to Mr. Watson, who was graduated S.B. *summa cum laude* (engineering) in the same year.

In 1858 he took a second degree S.B. *summa cum laude* in mathematics, while serving as instructor in the differential and integral calculus in the Scientific School; soon after he was tendered the professorship of mathematics in Antioch College, Ohio, which he declined. He now joined the American Association for the Advancement of Science and in the following year presented a paper on a "New System of Coordinates, with its application to Evolutes and Caustics."

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About this time a *Mathematical Monthly* was started in Cambridge in which he took great interest, and contributed many articles during the three years of its existence.

**Life in Paris.**

When he went to Paris in 1859 for the purpose of further study, he was requested to present to Madame Laplace, then living at the advanced age of ninety, the bust of Dr. Bowditch, the translator of La Mécanique Céleste. This mission gave him great pleasure, for Madam Laplace received him most cordially and introduced him to many persons of high scientific attainments. She testified her appreciation of the gift by placing the bust between Laplace's and Newton's. He attended lectures at the Sorbonne, and soon made the acquaintance of Professor Chasles, at whose table he met many distinguished scientists, as Bertrand, Liouville, Chevreul Delaunay, etc.

**Madame Laplace.**

When he made occasional visits to Madame Laplace, she related anecdotes of the time of Louis XVI, of the Revolution and of the first Empire. On one occasion she described her meeting with Franklin at the house of Madame Lavoisier; on another, of being seated at dinner next to Napoleon, who told her the circumstances of his examination for the artillery service by Laplace. She also gave him a volume written by Laplace with a specimen of the author's handwriting, which he afterwards had lithographed and published in the *Mathematical Monthly*.

**British Association in 1860.**

In 1860 he made a short visit to England, on the occasion of the meeting of the British Association at Oxford. The most memorable event of this meeting was the attack on Darwin's "Transformation of Species," by the Bishop of Oxford, in the course of which he said, turning to Professor Huxley, "I should like to ask him as to his belief in being descended from an ape." When Professor Huxley was unwillingly called upon to respond, he said: "I asserted and I repeat, that a man has no real reason to be ashamed of having an ape for his grandfather; if there were an ancestor whom I should feel shame in recalling, it would be a *man*, a man of restless and versatile intellect, who, not content with sucesses in his own sphere of activity, plunges into scientific questions with which he has no real acquaintance only to obscure them by his aimless rhetoric, and distract the attention of his hearers from the real point at issue by eloquent digressions, and skilled appeals to religious prejudices."

**French Pronunciation.**

During Mr. Watson's studies in French, he made the acquaintance of Adrien Féline, the author of a number of French books

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written in phonetic characters. This interested him so much, that he afterwards had one of Féline's books published in America, as it seemed to him the most perfect method of acquiring the complete and accurate French pronunciation, after having mastered the elementary sounds. Besides the university he visited the celebrated *École Centrale des Arts et Manufactures*, the *École Polytechnique*, and entered as a student, in 1860, the *École Imperiale des Ponts et Chaussées*, in order to become perfectly familiar with the methods of teaching.

*The École des Ponts et Chaussées.*

This school was founded by the celebrated engineer, Perronet, for the purpose of instructing the engineers of the kingdom, who had been organized under the title of *Corps des Ponts et Chaussées*. The duties of this corps are to prepare the plans for the great public works undertaken by the State, as river and harbor improvements, lighthouses, roads, railroads, bridges, etc., to superintend the construction and to liquidate the expenses thus incurred. The regular students are selected from the first twenty-five graduates of the Polytechnic School. The instruction is twofold: first, that given in the school; second, the practical instruction of missions. The school instruction consists of lectures, graphical works, manipulations and assays of materials of constructions, exercises in the field of leveling and surveying and visits to the manufactories.

The most important part of the instruction, and that to which everything else is subservient, is given by *projêts;* these consist of exercises in construction and design, involving the determination of the strength, dimensions and proper proportions of the parts, either by graphical methods, or by computation. The *projêt* is the characteristic feature of the instruction in the European technical schools, and their students employ from one half to two thirds of their whole time in making the researches, computations, drawings and memoirs which unite to form what is called a *projêt*. To give a clear idea of the nature of these problems, the program of one selected from the French collection is here given. For example: A map and a longitudinal section of a river between two towns is given to the student, and he is required to make the plans necessary to improve the river so as to obtain a certain depth of water throughout; the improvement should be accomplished by building movable dams with side locks, by making cut offs, or by a combination of both systems; he is required to make drawings of the works to be con-

*Projêts.*

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structed, estimates of costs, with an explanatory memoir. Such projects, selected as they are from actual practice, stimulate the student's inventive faculties to the utmost; thus he is enabled, by the successful execution of a properly prepared series of such exercises, to acquire what may be justly termed an anticipated experience.

Mr. Watson wrote a description of the foregoing schools which was published in the *Mathematical Monthly*, and at the same time he contributed a treatise on Descriptive Geometry of one Plane. During his stay in Europe he made extensive tours through France, Germany, Austria and Switzerland, visiting technical schools, and studying their methods of instruction. He stayed some time at Carlsruhe to make a special study of the Polytechnic School which was presided over by Professor Redtenbacher, the most celebrated instructor in mechanical engineering in Europe. He resided for a time at Jena, and in 1862 received the degree of Doctor of Philosophy from the University.

**Travels.**

In 1861 there had been published the "Objects and Plan of an Institute of Technology" including a Society of Arts, a Museum of Arts, and a school of Industrial Science, to be established in Boston. On his return, Dr. Watson was elected a member of the Society of Arts, and read before it papers describing the various schools he had visited in Europe, with an account of their history, organization, conditions for admission, courses of study, methods of instruction, graphical works and practical exercises. He thus became intimately associated with Professor William B. Rogers, the author of the "Objects and Plan of an Institute of Technology," Professor Rogers having long been attached to the University of Virginia, naturally founded the new school upon that as a model; hence he divided the instruction among a number of separate schools, viz.: School of Design, of Mathematics, of Physics, of Chemistry and of Geology.

**Institute of Technology.**

During the fall and winter of 1863–64, Professor Rogers, Mr. Runkle and Dr. Watson, held long and frequent consultations in reference to the proposed School of Industrial Science, during which Dr. Watson showed Professor Rogers the details of the instruction, both theoretical and practical, of several schools with which he had been connected in Europe. The result of these consultations and conferences was embodied in a pamphlet entitled, "Scope and Plan of the School of Industrial Science of the Massachusetts Institute

**Scope and Plan.**

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of Technology," published in May, 1864, in which the plan of the separate schools of design, mathematics, physics, chemistry and geology was abandoned, and the European idea adopted, of giving a "full course of scientific studies and practical exercises to such students as seek to qualify themselves for the professions of the civil, mining and mechanical engineer, the architect and chemist."

In the month of June, Professor Rogers sailed for Europe for a short summer trip, and was commissioned by the government of the Institute to purchase models and apparatus at his discretion to an amount not exceeding one thousand pounds. Dr. Watson furnished him with lists of models in descriptive geometry and mechanism, also one of surveying instruments, indicating the makers in Paris and in Darmstadt. These models and instruments were procured and found extremely useful for the purpose of instruction.

Models and Instruments.

University Lecturer at Harvard.

Dr. Watson became University lecturer at Harvard, 1863–64, and in his lectures he called attention to a controversy between Professors Sylvester and Merrifield, two eminent mathematicians, both members of the Royal Society, and showed that the results obtained by one, were, by mathematical transformation, identical with those of the other. Professor Benjamin Peirce, who was present, expressed great pleasure at this result, and soon after Dr. Watson was elected Fellow of the American Academy of Arts and Sciences. The next year, on the receipt of a gift to the Scientific School, the Dean offered an assistant professorship in the school to Dr. Watson, but preparations for beginning the instruction in the Institute had already been made, and on the twentieth of February, 1865, the preliminiary course of the school was begun, the professorship of civil construction being assigned to Dr. Watson. In the autumn the name of the professorship was changed to that of descriptive geometry and mechanical engineering. No text-books on the latter subject were in existence in the English language, and Professor Watson made extensive use of Redtenbacher's course given at the Polytechnium at Carlsruhe. He prepared a treatise on descriptive geometry, which was eventually used.

Professor in the Institute of Technology.

In 1867 he attended the French Universal Exhibition, and during his stay in Paris he took lessons in modeling in plaster. He also procured a set of models to illustrate the instruction in stereotomy with sets of modeling tools; and on his return, in connection with his lectures on that subject, he introduced for the first time in America

Instruction in Stereotomy.

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the actual construction in plaster of problems occurring in masonry, as doorways, groined and cloistered arches, domes, staircases, etc. Thus, when the appropriate drawings were finished, the students, supplied with the proper tools and pieces of rough plaster, were required to make the objects themselves by means of patterns cut from their own drawings.

He also took advantage of this visit to Europe to spend some time in Carlsruhe, where he prepared lithographic notes for his lectures on the Elasticity and Resistance of Materials.

In 1869 he made another visit to Europe, and brought home collections of models for instruction in descriptive geometry and mechanism, with valuable drawings from the Polytechnic School at Carlsruhe.

During the following years he gave public lectures in the Lowell course on drawing and perspective, and on mechanism; and read from time to time papers on machines and engineering before the Society of Arts. He was married, August 21, 1873, to Margaret, daughter of Augustus H. and Hannah Bradford Fiske, of Boston, Massachusetts. He was appointed United States commissioner to the Exposition at Vienna (1873); and remained in Europe during that and the following year, collecting materials for a report made to the United States Government. On his return he read a number of papers before the American Social Science Association, viz.: "Comparison Between Railways and Waterways in France"; "On Technical Instruction in Europe"; "On the Russian System of Shop-work Instruction for Engineers and Machinists"; On the Protection of Workmen from Accidents in Factories."

**Marriage.**

**Comissioner to Vienna.**

In 1878 he went to Paris to represent the American Society of Civil Engineers at the Paris Exposition.

**Paris Exposition 1878.**

He was appointed member of the jury on civil engineering, public works and architecture. On this occasion he was elected member of the French Society of Civil Engineers, honorary president of the Paris Congress of Architects and honorary vice-president of the Congress of Hygiene. He was invited to attend the meeting of the French Association for the advancement of science, and made honorary president of the engineering section; this honor was repeated in 1881, 1883 and 1889.

**Member of the Jury.**

In 1887 he went abroad for recreation, and was present at the Queen's Jubilee in London.

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Paris Exposition of 1889. U. S. Report.

In 1889 he went to England with the two Societies of American Engineers of which he was a member. They were entertained by the English Society of Engineers at Liverpool, Manchester, at a dinner at Guild Hall, London and shown the newest public works. With half a dozen associates he spent a delightful day with Professor John Tyndall at Haselmere, and the same evening, on the invitation of Sir Lyon Playfair, he attended the conversazione of the Royal Society.

From London they went to Paris and were entertained by Eiffel, and personally shown the Exposition of Paris.

Congress of Inland Navigation.

Professor Watson attended the Congress of Inland Navigation, and at the end accepted with others an invitation to accompany the minister of public works in a journey down the Seine to see the works for the improvement of the river. Banquets were given to the minister and members of the Congress by the municipalities of Rouen and Havre. He attended the International Congress of Construction, presided over by M. Eiffel, and was honored by being made a vice-president of the Congress. He was also invited by the United States commissioner to prepare a report on the civil engineering, public works and architecture of the Exhibition. This invitation was accepted, and he began forthwith to collect materials for the report.

Congress of Construction.

Stereotyped illustrations relating to the public works of France were obtained through the courtesy of M. Collingnon, inspector of the school of roads and bridges, and numerous friends in Paris supplied him with drawings, photographs and descriptions of the works exhibited by themselves.

The next two years were occupied in the preparations of a very extensive and elaborately illustrated report which was duly published at Washington, and has been thoroughly appreciated by engineers in the United States and in Europe.

In 1890 he was enrolled amongst the contributors to the *Annals des Traveaux Publics.*

In 1892 he went to Paris to attend the International Congress of Internal Navigation, and on his way he met Mr. Dore, from Chicago, sent to invite its members to attend the Water Commerce Congress to he held at Chicago during the ensuing year.

As a member of the Congress, Mr. Watson was able greatly to assist Mr. Dore in the accomplishment of his object; and when Mr.

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Dore returned home, he proposed to the directors of the Chicago Congress that Professor Watson be requested to make the program, and to arrange the administrative details of the Chicago Congress. Professor Watson accepting this offer, invited the most distinguished river and harbor engineers to serve as members of the advisory council, and to send papers. Twenty-three elaborate memoirs were sent, beside other shorter communications. Russia, France, Germany and Portugal sent special delegations, and the other European countries were represented by individual members.

Congress of Internal Navigation at Chicago, 1893.

Mr. Watson contributed five memoirs on recent improvements in European navigation.

At the conclusion of the Congress, resolutions were passed thanking the president and secretary. The president remarked that "the success of the Congress was mainly due to the ability and untiring efforts of Professor Watson," and its publications and photographs were presented to him by the Congress "as tokens of its appreciation of his disinterested services which have largely contributed to the success of its sessions."

During the following years Mr. Watson collected and published the documents connected with the Congress, forming an illustrated volume of five hundred pages.

In 1894 he attended the Fifth International Congress at the Hague. The most noteworthy and picturesque incident of this journey was an excursion to the island of Urk. This island was inhabited by Dutch fishermen who had no other communication with the mainland than their boats; as a consequence, the dress, manners and custom of the islanders had not changed for two hundred years.

Congress at the Hague.

In 1896 he was invited to become a correspondent of the *Österreichische Vierteljahrschrift für den öffentlichen Baudienst*, published in Vienna, and contributed to that quarterly an illustrated paper entitled "*Die Construction des Tunnels für die elektrische Strassenbahn in Boston.*"

In 1897 Professor Watson made a visit to Egypt going up the Nile as far as the first cataract. He also visited the Paris Exhibition in 1900.

He has not forgotten the Coffin School in which he received his early instruction, and when recently manual training was introduced, he testified his appreciation, by presenting four lathes furnished with

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velocipede foot-power, and a full outfit of the tools used in wood-turning.

Besides his journeys for special scientific objects, he has visited Europe and traveled extensively through Germany, Austria, Italy, Spain, Greece and Constantinople, besides Mexico, California and the Bermudas.

## Learned Societies

The National Academy of Cherbourg; the Berlin Society of Industrial Engineers (*Verein Zur Beförderung des Gewerbfleisses*), and the Civil Engineers of France elected him to membership as did the American Society of Civil Engineers, and the American Society of Mechanical Engineers; the American Association for the Advancement of Science made him a Fellow.

His political affiliation was with the Republican party, except when Grover Cleveland was a candiate for the presidency against James G. Blaine, when he voted for Cleveland.

His religious views led him to the Unitarian denomination.

As recreations from professional work he had recourse to mathematics and symbolic logic, to golfing and tricycling.

He is a member of the Colonial Society of Massachusetts, and also a member of the St. Botolph; the Athletic; the Round Table; the Mathematical and Physical Clubs.

His authorship includes seven papers in the *Mathematical Monthly* (1858–61); nineteen read before the Society of Arts of the Massachusetts Institute of Technology (1869–1880); four read before the American Social Science Association (1875–1880); one read before the American Association for the Advancement of Science (1859); three read before the American Academy of Arts and Sciences, besides biographical notices of Stephen Preston Ruggles (1881), Henry Lawrence Eustis (1885) and the Marquis of Caligney (1894); two read before the Boston Society of Civil Engineers (1881); three published in Van Nostrand's *Engineering Magazine* (1878); one published in the *Plumbers and Sanitary Engineer* (1880); and five read before the World's Columbian Water Commerce Congress, Chicago, Illinois, 1893.

His published books include: "Technical Education" (1873); "A Course in Descriptive Geometry" (1873); "On the Protection of Life from Casualties in the Use of Machinery" (1880); "A Course

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in Shades and Shadows" (1889); and reports on the Civil Engineering, Architecture and Public Works at the Vienna Exposition (1873), and at the Paris Exposition (1889); United States Government Reports (1875 and 1891).

His counsel to young men: "Be independent, frugal, industrious and self-reliant, and choose such an occupation that your highest enjoyment will be in your work."

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